

US-PAT-NO: 6311576

DOCUMENT-IDENTIFIER: US 6311576 B1

TITLE: Anti-backlash nut for lead screw

DATE-ISSUED: November 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP
CODE COUNTRY			
Pletschet; Timothy J.	San Francisco	CA	N/A
N/A			

US-CL-CURRENT: 74/441; 74/89.42

ABSTRACT:

An anti-backlash nut includes a body having an axially-extending bore and internal threads for engaging a lead screw inserted into the bore. The internal threads are divided circumferentially into three inner segments each movable in a radial direction. The anti-backlash nut also includes springs for independently biasing the inner segments radially inward to contact the lead screw. The anti-backlash nut provides wear compensation as well as anti-backlash to improve positioning repeatability when used with an open loop positioner.

13 Claims, 6 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 2

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TITLE: Rotary actuator for precision applications

PUBLICATION-DATE: September 26, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE
COUNTRY RULE-47		
Tidwell, Terry Lynn	Fayetteville	AR US

US-CL-CURRENT: 409/201,409/211

ABSTRACT:

A rotary actuator with improved damping and stiffness is disclosed. The rotary actuator includes one or more bearing plates that form sliding-surface bearings to provide the desired preload to the rotary actuator. One embodiment of the invention includes a multi-piece bearing plate that makes repair or replacement of the bearing material in the sliding-surface bearings easy to perform. Another embodiment for applications where heat dissipation is critical includes thermal barriers on either side of the sliding-element bearings, with resilient members between the thermal barrier and a bearing ring used to supply the appropriate preload to the output shaft. The invention is particularly suited to precision applications, such as the drive unit for the swivel mechanism on the spindle head of certain types of five-axis milling machines.

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Detail Description Paragraph - DETX:

[0031] Bearing material 28 is adhered to annular surface 32 on each of output bearing plate 22 and input bearing plate 24, such that bearing material 28 presses against bearing surface 34 at each end of housing 20. Preferably, one of several suitable commercially available materials made of polymer or polymer-based composites are used for bearing material 28. In particular, the preferred polymer for bearing material 28 is polytetrafluoroethylene (PTFE). PTFE is unique in that its coefficients of static and dynamic friction are nearly equal. Some common trade names for such materials are Garlock, which is manufactured by Garlock Sealing Technologies of Palmyra, New York, and Turcite, which is manufactured by Busack+Shambam, Inc. of Abingdon, United Kingdom. These materials are cut to the desired shape and adhered to output bearing plate 22 and input bearing plate 24 to form bearing material 28. The adhesive used to attaching bearing material 28 to annular surface 32 is preferably Scotch-Weld, which is manufactured by the 3M Corporation of St. Paul, Minn., but other suitable adhesives may also be used. Bearing surface 34 is ground or milled to a bearing-quality finish.



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No.	Doccode	Number of pages
1	CTNF	7
2	892	1
3	NPL	31
4	NPL	35
5	1449	1

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